IN THE CLAIMS

Please amend claims 1, 4, 5; cancel claim 3; withdraw claims 7 - 17, and add new claim 18.

LISTING OF CLAIMS

Claim 1 (Currently Amended) A method of carbon allotropes synthesis for use in a hot plasma zone of arc discharge plasma apparatus comprising the steps of:

selecting consumable graphite and non consumable graphite electrodes wherein at least one of said electrode having at least one longitudinal inner channel for delivering of a buffer gas outflow, feedstock material and catalyst to between electrode gap;

creating a radial buffer gas outflow in said gap between anode and cathode in the hot plasma zone;

continuous feeding to the hot plasma zone of the consumable electrode, feedstock material and catalyst admixed with the buffer gas outflow injected through the longitudinal inner channel of the electrode;

forming in the hot plasma zone a vapor from the consumable electrode and consumed materials;

continuing an arc plasma process of carbon allotropes synthesis until anode is consumed;

removing from the hot plasma zone by the radial buffer gas outflow the produced vapor for quenching and condensing;

and forming and collecting of carbon allotropes contained soot.

Claim 2 (Original) The method as defined in claim 1, wherein the said continuous feeding of selected electrode, feedstock material and catalyst into the hot plasma zone is performed by

moving of at least one consumable electrode towards the said hot plasma zone.

Claim 3 (Cancelled)

Claim 4 (Currently Amended) A method as defined in claim 1, wherein said buffer gas is an inert gas selected from the group consisting of helium only, mixture of helium with up to 20% of argon, and mixture of helium with up to 10% of nitrogen.

Claim 5 (Currently Amended) The method as defined in claim 1, wherein said vapor [[being]] is removed from the hot plasma zone to a volume of a reaction vessel by force of the buffer gas outflow [[for]] to increase [[ing]] productivity, and yield and completely eliminating deposits on the cathode [[deposit]].

Claim 6 (Original). The method as defined in claim 1, wherein a produced carbon soot contains at least one molecule of fullerene and/or at least one carbon nanotube.

Claim 7. (Withdrawn) A DC arc discharge plasma apparatus for fullerenes and nanotubes synthesis comprising: a water-cooled reaction vessel, an electrode system sealed in said reaction vessel, wherein said electrode system having anode and cathode with at least one longitudinal inner channels therein for creating buffer gas outflow, feeding feedstock and catalyst through said longitudinal inner channels to a hot plasma zone and also for removing of produced vapor from the hot plasma zone by said buffer gas outflow.

Claim 8. (Withdrawn) The DC arc discharge plasma apparatus for fullerenes and nanotubes synthesis according to claim 7 further comprising: a device for alternative temporarily changing polarity of electrodes during operation for removing cathode deposit.

Claim 9. (Withdrawn) The DC arc discharge plasma apparatus for fullerenes and nanotubes synthesis, according to claim 7, further comprising a filtration and gas re-circulation means to separate carbon soot from inert gas.

Claim 10. (Withdrawn) The DC arc discharge plasma apparatus according to claim 7, wherein said anode and cathode have different cross sectional areas comprising differently assembled blocks, said blocks shape consisting of rods, bars and rods and bars, where said rods, bars and rods and bars are assembled in tight contact along longitudinal sides to form inner longitudinal channel.

Claim 11. (Withdrawn) The DC arc discharge plasma apparatus according to claim 7, wherein said cathode comprising distal end with outlet holes, said distal end with outlet holes being connected with said longitudinal inner channel to uniformly distribute buffer gas outflow in the hot plasma zone.

Claim 12. (Withdrawn) The cathode of the said electrode system according to claim 7, wherein said cathode comprising an additional peripheral annular gas channel to block a side carbon deposit on a cathode surface.

Claim 13. (Withdrawn) The apparatus according to claim 11, wherein said outlet holes in order to improve gas dynamic of the gas outflow injected into the hot plasma zone have a specially shaped chamfered, fillet or cylindrically straight hole ends.

Claim 14. (Withdrawn) The apparatus as defined in claim 10, wherein said block assembled anode has inserts of metallic catalytic wires or strips.

Claim 15. (Withdrawn) The DC arc discharge plasma apparatus for fullerenes and nanotubes

synthesis according to claim 7 wherein said electrode system in order to achieve maximum productivity and optimal yield should allow to maintain a ratio by mass between buffer gas outflow rate and anode evaporation rate within 1 to 10.

Claim 16. (Withdrawn) A DC arc discharge plasma apparatus for fullerenes and nanotubes synthesis comprising: a water cooled reaction vessel; an electrode system sealed in said reaction vessel; wherein said electrode system having anode and cathode with at least one longitudinal inner channels therein for creating buffer gas outflow, feeding feedstock and catalyst through said longitudinal inner channels to a hot plasma zone and also for removing of produced vapor from the hot plasma zone, wherein said cathode comprising an additional peripheral annular gas channel to block a side carbon deposit on a cathode surface and wherein said cathode comprising distal end with outlet holes, said distal end with outlet holes being connected with said longitudinal inner channel to uniformly distribute buffer gas outflow in the hot plasma zone; a feeding system to provide continuous consumption of anode and inflow of feedstock and catalyst admixed with buffer gas outflow; a device for alternative change of electrodes polarity; a filtration and gas re-circulation means to separate carbon soot from inert gas; and a device for inclination of reaction vessel with respect to vertical position;

Claim 17. (Withdrawn) The DC arc discharge plasma apparatus according to claim 16, wherein said reaction vessel being mounted pivotably on a stationary support for said reaction vessel inclination around horizontal axis up to 120 degree with respect to vertical position.

Claim 18. (New) The method as defined in claim 1, wherein said method in order to achieve maximum productivity and optimal yield maintains a ratio by mass within 1 to 10 between injected buffer gas outflow rate and anode evaporation rate.